

Additionally, approximately two large areas of the project in project sections B and C are proposed to be regraded to correct existing drainage problems.

Alternative Surfacing/Soil Binder

During the project coordination process, the merger team requested that NCDOT investigate a soil binder and/or alternative surfacing method for one or more of the alternatives to lower the maintenance rather than studying only paving options. NCDOT agreed to look into adding the soil binder/alternative surfacing method to Alternative B.

As a starting point, the USFWS suggested reviewing a document titled “Environmentally Sensitive Maintenance for Dirt and Gravel Roads”. This document was produced by Penn State University in cooperation with the Pennsylvania Department of Transportation (PennDOT). The Dirt and Gravel Road Program was formed 12 years ago by the State Conservation Commission Commonwealth of Pennsylvania to develop a more cost effective maintenance program and provide long-term solutions to prevent erosion and storm water pollution, while promoting sustainable unpaved roads. The program targeted mainly locally maintained unpaved roads. This document, dated December 2007, serves as a manual to provide guidance using natural systems and innovative technologies to reduce erosion, sediment and dust pollution while more effectively and efficiently maintaining dirt and gravel roads. Of particular interest to USFWS was Chapter 7 of this document. This chapter covered additional maintenance techniques, which included dust control, road stabilization and geosynthetics. These topics are evaluated below for application to Needmore Road.

Dust Suppressants

Several different types of dust suppressants were discussed in the document. All of these dust suppressants are applied to the surface of the unpaved road with a sprayer of some sort. The dust suppressants act as a binder and help stabilize a road by keeping the fines of a gravel road in place, which in turn keeps the larger aggregate in place. Further reviews of the individual products mentioned were conducted. One of the main problems with most dust suppressants is that they are not recommended for use in close proximity to water (they can be damaging to the environment). Another problem noted is that multiple applications could be required depending upon the traffic load or if the road is disturbed by grading activities. This would reduce the cost effectiveness of suppressants. Finally, these products are mainly designed to act as a dust suppressant, not a road stabilization product.

Road Stabilization Methods

Many of the other road stabilization techniques outlined in this section of the document were more structural (adding new material to raise the road elevations, re-grading and shaping the road with a proper crown and good compaction, including the use of geosynthetics for the roadbed along with drainage and embankment stabilizations) rather than application of material to the current gravel road surface to bind it together. It is possible that some of these structural techniques could be used to improve certain aspects of Needmore Road, but further research would be required. Also, several of these techniques are already in use on Needmore Road, while others are not applicable.

The most promising road stabilization material/technique identified in the document was a material named Driving Surface Aggregate (DSA). It was developed by Penn State’s Center for Dirt and Gravel Road Studies and is specifically designed for maximum compaction for use as a driving surface on unpaved roads. DSA is a mixture of crushed stone with a unique particle